

## **JPL's Multi-Mission Operations Strategy for the Next Decade**

### **Abstract**

Since the beginning of the NASA space program, each center has been tasked with the design, development and operations of a set of project resources necessary to accomplish its mission objectives. Those resources during the earlier years of the program could have been described as unbounded in comparison with today's resource restrictions. As NASA's program matured in the 1980's and even more so in the early 1990's, it became evident that with the reductions in project resources significant changes were needed if the Jet Propulsion Laboratory (JPL) were to have any program at all. Therefore, since the mid-1980's JPL has undertaken steps in an effort to remain fiscally responsible while maintaining its role as the "leader in the exploration of the universe".

Five major approaches have been considered for reducing the cost of operations at JPL. These include 1) development of a re-usable ground data system, (2) building to existing ground capabilities, (3) a consolidation of adaptation resources, (4) the development of an integrated flight and ground architecture, and 5) development of a set of standard TMOD Services. These standard services consist of two types of services, Data Services and Mission Services.

The Telecommunications and Mission Operations Directorate (TMOD) at the Jet Propulsion Laboratory (JPL) has been charged with mission operations support for JPL's science and technology missions. TMOD's Mission Services and Application's Office (MS&A) has the responsibility of providing a major portion of these Mission Services. To make this real, MS&A has developed several of these services and is in the process of developing the remaining set for which it is responsible. "Prototype" operations of several of these services have been demonstrated on existing missions including the Telecom Link Analysis, Spacecraft Time Correlation and Sequence Engineering. Future work will complete the formal development of the MS&A set of services. All of this has occurred prior to the formalization of the TMOD Operations Concept.

This paper will present an overview of the TMOD Standard Services to provide context to the proposed approach for TMOD operations. A presentation of TMOD's Operations Concept extended to the Mission Services level will be provided which in turn will be mapped to the operational needs of Mission Service's. Application of the lessons learned from the "prototype" services will be applied against the classes of missions anticipated in the next decade and the Operations Concept. Because experience has shown that although similarities exist between missions and even classes of missions, there will exist unique operational requirements driven by different operational needs. This paper will address how MS&A is planning to accommodate these missions operationally. Finally, projected resource savings will be identified, if possible, over conventional mission operations approaches.

The work described in this paper is being carried out at the Jet Propulsion Laboratory/California Institute of Technology under contract to the National Aeronautics and Space Administration.